

Structure and Method to Increase Density of MIM Capacitors in Damascene Processes

ABSTRACT OF THE DISCLOSURE

A high density MIM capacitor structure and method of manufacturing the same is disclosed for integrated circuits having multiple metal layer interconnections. The capacitor structure is formed between selected first and second metallic interconnections which are separated by an insulating intermetallic oxide layer. A first metal-dielectric-metal layer capacitor is created over and with a portion of the first metallic interconnection and a second metal-dielectric-metal layer capacitor is created under and with a portion of the second metallic interconnection. A first metal via through the insulating intermetallic oxide layer connects the first metal-dielectric-metal layer capacitor and the second metal-dielectric-metal layer capacitor to form a first terminal of the capacitor structure and a second metal via through the insulating intermetallic oxide layer connects the first metallic interconnection portion and the second metallic interconnection portion to form a second terminal of the capacitor structure. Damascene processes are used to manufacture the multiple metal layer interconnections.

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